MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2017/2018

BMG3014 – MANAGEMENT OF TECHNOLOGY

(All Sections)

6 JUNE 2018
2.30 p.m. - 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **FIVE (5)** printed pages including the cover page.
2. There are **THREE (3)** sections.
3. Answer **ALL** sections.
4. Marks are shown at the end of each question.

SECTION A: 20 MARKS

There are TWO (2) questions in this section. Candidates MUST answer ALL questions.

1) Define "Technology" and "Innovation". (8 Marks)

2) Compare and contrast between "Management of Technology" and "Management of Innovation". (12 Marks)

SECTION B: 40 MARKS

There are FIVE (5) questions in this section. Candidates MUST answer ANY FOUR (4) questions.

Question 1

a) What are the factors that underline the importance of managing technology and innovation for modern businesses? (4 Marks)

b) Innovation can arise from many different sources and the linkages between them. Identify the common sources of innovations. (3 Marks)

c) Identify the key aspects of Management of Technology. (3 Marks)

Question 2

Critical Factors in Managing Technology

Tasks involved in managing technology are creating technology, developing products/services, and successfully marketing them. In this regard, great creativity along with a system designed to exploit it, is necessary as well as investing in R&D. Discussing about creativity in the context of technological change needs understanding of two terms which are invention and innovation. Invention by definition can be used for an event new to the world while innovation is a process new to an organization and need not to be new to the world. Innovations in the literature is classified either as radical (revolutionary) inventions which are based on inventions and change or create new industries or, incremental (evolutionary) inventions which are small but important improvement in a product, process, or services and significantly help firms to maintain their competitiveness. Hence, the pivotal role of continuous creativity is obvious in both innovation and invention.

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In order to bring the innovation to the market there are time lags between scientific discoveries, invention, innovation, and finally introduction to the market which most of the companies try to reduce these time lags to reach the market sooner and reap their reward. However, it is also possible that a company delay the diffusion of the technology to the market in order to fully utilize its benefits. While the technology comes to the market, if the knowledge of the customer about that technology is much lesser than the company, the owner of the technology will be able ask for premium price from its customer nevertheless, as the customer gain experience about the technology the gap starts to shrink.

From: Tarek Khalil (2000) "Management of Technology: The Key to Competitiveness and Wealth Creation" McGraw-Hill, USA.

a) Given the above points highlighted in the article, discuss how you would go about in coming up with the innovation strategy for an organization in general. (5 Marks)

b) The article above also mentioned about the diffusion of technology. This is referring to the adoption rate of technology by users. Identify and briefly discuss the various categories of innovation adopters. (5 Marks)

Question 3

a) You are evaluating a new R&D project proposal submitted by your product development team. On your desk you have 5 other proposals each requesting for budget from your limited allocation. The current proposal you are reviewing is asking for an initial investment/project cost of 2 million. Following is the team's projection for their cumulative discounted cash inflows:

- Year 1 $934400.0
- Year 2 $1833400.0
- Year 3 $2673020.0
- Year 4 $3465110.0

In order to help you come towards a decision you need to determine the time required for the project to break even using discounted cash flows.

(4 Marks)

b) You have successfully secured an R&D contract from a large client from another state. This is a major achievement for you and has the potential for subsequent contracts if the project is a success. The top management is taking special interest in the progress of this project. You are now approaching the last few milestones. The main remaining milestone will be the transfer of the technology from your site to the client's. Discuss how communications play an important role in ensuring success of the transfer process.

(6 Marks)

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Question 4

a) In 2003, Procter & Gamble (P&G) was the world's largest household and personal products company, with $43.4 billion in net revenues. It had almost 7,500 scientists working in 20 technical centers on four continents. In 1999, P&G's CEO Durk Jager had initiated a major reorganization, "Organization 2005," intended to accelerate innovation. New product development would be more decentralized, conducted in both U.S. and foreign markets. Products would be tested in U.S. and foreign markets simultaneously. Regional business units were replaced with global business units based on product lines. Business services would be centralized. However, by 2000, stockholders had become impatient for results, and Jager was pressured to step down. Discuss the lessons that were derived from P&G's experience in terms of organizational issues that affect firms' technology management success.

(4 Marks)

b) Recently, you and your team had completed a Technology Audit exercise for your firm. You have categorized your technologies into Base, Key and Pacing. What understanding does this provide you and what considerations you most likely will have for each category? (6 Marks)

Question 5

"In the past four decades technology has fundamentally altered our lives: from the way we work to how we communicate to how we fight wars. These technologies have not been without controversy, and many have sparked intense debates that are often polarized or embroiled in scientific ambiguities or dishonest demagoguery. The debate on stem cells and embryo research, for example, has become a hot-button political issue involving scientists, policy makers, politicians and religious groups. Similarly, the discussions on genetically modified organisms (GMOs) have mobilized civil society, scientists and policy makers in a wide debate on ethics and safety. The developments in genome-editing technologies are just one example that bioresearch and its impact on market goods are strongly dependent on social acceptance and cannot escape public debates of regulation and ethics. Moreover, requests for transparency are increasingly central to these debates, as shown by movements like Right to Know, which has repeatedly demanded the labeling of GMOs on food products."

Excerpt taken from: https://www.scientificamerican.com/article/the-many-ethical-implications-of-emerging-technologies/

Based on the above, discuss whether managers need to be concerned with the ethical implications when considering technologies and innovations for their businesses.

(10 Marks)

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SECTION C: 40 MARKS

There are THREE (3) questions in this section. Candidates MUST answer ALL questions.

The Robot-Operated Power Plant of the Future
By The Week Staff

Each week, we spotlight a cool innovation recommended by some of the industry's top tech writers. This week's pick is an AI-driven power plant.
Mitsubishi Hitachi Power Systems has broken ground in Japan on a hydrogen-fueled plant that will be run by artificial intelligence, said Jim Polson and Naureen Malik at Bloomberg. The plant will dispense with the need for human operators and run autonomously, according to Paul Browning, the chief executive of the operation. AI will be able to better coordinate power systems and make them more flexible, Browning said.
If all goes to plan, "the plant will be capable of diagnosing system failures before they happen and dispatching its own power based on weather and supplies in the market." The company says the facility will use power from wind or solar to convert water to hydrogen, then burn it based on demand. "There's going to be autonomous cars," Browning said, "There's also going to be autonomous power plants." The facility is scheduled to be operational in 2020.
http://theweek.com/articles/768444/robotoperated-power-plant-future (April 24, 2018)

a) The article above highlights the importance of innovation for modern businesses in order to ensure competitiveness and growth. The challenge is that management need to ensure that their firm plans the products development so that there is a timely pipeline of products, i.e.: at any given time there are products at the earlier stages of their lifecycle positioned to grow and replace the current top products that will eventually move to the later stages of the lifecycle and decline. Discuss and illustrate the Technology Life Cycle model which is a useful framework for the management to ensure they achieve this goal.

(20 Marks)

b) Your firm is considering acquiring Mitsubishi Hitachi Power Systems. You are in discussion with your team to understand how to value the technology. Discuss how "Network Externality Value" and "Technology's Stand-alone Value" shape the total value of a technology. (15 Marks)

c) The article above reporting an example of an innovation which belongs to which of the top ten technology trends for 2018 as identified by Gartner? (5 Marks)

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